

Notes on the Flora of James Bay.

JAMES M. MACOUN.

To the botanist especially interested in the distribution of plants there is perhaps no district which affords better opportunities than James bay for noting the interchange of species. If the coast line be followed, the change is so gradual as one proceeds northward, that a thorough examination day by day of the flora a mile inland from the coast will result in the discovery of but few species that had not been observed before, but it will be seen that the more southern forms are gradually disappearing; along the coast itself northern species become more and more abundant, while the islands a few miles from the shore present a flora that is essentially arctic. When one remembers that many days after the snow has disappeared from the woods huge masses of ice lie piled along the shore, and that long after these have been melted by the warm rays of the June sun other masses, driven by wind and current from the far north, are stranded upon the islands of the bay, it is not difficult to account for the great difference between the species growing on the mainland and on the islands, although the latitude and elevation be the same.

A general description of the flora of James bay would be impossible, as, while the west coast is low and bordered by marshes, the east coast is rocky and much higher, and the immense mud flats of the western and southern shores are entirely wanting. Although the cold currents from the north enter the bay along the western shore, the water is so shallow that floating icebergs, even of small size, ground many miles from land, while on the eastern side of the bay the water is very deep, and the ice is moved here and there by every change of tide. The plants found along the western coast are simply those one expects to find throughout the wooded country of the north, and I shall confine myself to a brief mention of the more interesting species found on the mainland and islands of the eastern portion of the bay, and shall not attempt a general description of its flora, but will take the course northward that was followed last season, and note the more important changes as they occur.

Moose Factory, situated about eight miles from the mouth of Moose river, in lat. $51^{\circ} 18'$, may be taken as a starting point. Were it not that the number of species is smaller, no differ-

ence could be seen between the plants growing immediately about this place and those found throughout northern Ontario, and upon descending to the mouth of the river no species were seen that are not common along the Atlantic coast. Sailing in a northeasterly direction a distance of about sixty miles from Moose river, Charlton island is reached, from which the mainland may be seen both toward the south and east, and a very perceptible change is at once noticeable in the character of the flora. The first flower that meets the eye on stepping ashore is *Chrysanthemum arcticum* L. in profusion just below high-water mark, and a few yards higher up *Silene acaulis* L. and *Dryas octopetala* L. var. *integrifolia* Ch. & Scl. growing in tufts side by side, near them *Pedicularis flammea* L., and *Botrychium Lunaria* Swartz. The last mentioned species is very common on all the islands of James bay. On the wooded portion of Charlton island the species are almost identical with those noted at Moose Factory, but on the higher almost barren ground of the interior but few species grow, and these are mostly northern, among them *Campanula rotundifolia* L. var. *arctica* Lange, generally with white flowers, the beautiful pink-flowered form of *Achillæa millefolium* L., *Potentilla maculata* Pour., *Salix arctica* Pall., *Salix reticulata* L. and *Poa cenisia* All. A peculiar form of *Linum perenne* L. with white flowers is common on this and the other islands in James bay. I have never seen a blue-flowered specimen growing anywhere near James bay or Hudson bay, although I have collected this form as far north as lat. 56° on the west coast of Hudson bay; in habit, also, it is quite distinct from the western form of this species which I have; growing in sand just above high-water mark, it stretches itself along the ground, but is never erect as on the plains.

Crossing to the mainland and sailing north about 140 miles, Big river (lat. $53^{\circ} 50'$) is reached, and here a number of interesting species were collected, among them *Festuca ovina* L. var. *brevifolia* Wats., *Glyceria maritima* Wahl., *Deyeuxia Langsdorffii* Kunth, *Phleum alpinum* L., *Hierochloa alpina* R. & S., *Deschampsia atropurpurea* Scheele. var. *minor* Vasey (new var.), and a new species of *Deyeuxia* not yet described. In the pond along the borders of which this last mentioned species grew *Sparganium hyperboreum* Loest. was very abundant, although not seen in any other locality. *Juncus filiformis* L., *J. Balticus* Deth. and *J. triglumis* L. were all very common here, and *Luzula arcuata* Meyer and

L. spicata Desv. were by no means rare. The sand and gravel bars at the mouth of the river were covered with *Chrysanthemum arcticum* L. and *Matricaria inodora* L. The only ferns growing in this locality were *Botrychium Lunaria* Swartz, *B. ternatum* Swartz and *Aspidium spinulosum* Swartz, var. *dilatatum* Hornm.

About sixty miles southwest of the mouth of Big river lie two islands, "The Twins" (between lat. $53^{\circ} 5'$ and $53^{\circ} 20'$), each about thirty miles in circumference. These islands are quite barren, with the exception of a few stunted spruce trees. On the northern island there are perhaps not more than a score of these, and none of them are above six feet in height. Although low and spreading, they were of mature age and covered with cones, settling beyond a doubt that *Picea alba* Link goes farther north than *P. nigra* Link, on James bay at least. Around all ponds on these islands *Salix glauca* L. was very abundant, and on the north Twin island specimens of a new willow were collected which has been described by Mr. Bebb. While all the northern plants that had been seen before were found on these islands, many additional species were noted, principally endogens. *Carex rotundata* Wahl., *C. microglochin* Wahl., *C. rariflora* Smith and *C. nardina* Fries were the most interesting carices collected. *Potamogeton pectinatus* L. was common in all ponds, and about a dozen specimens in all of the rare *P. rutilus* Wolfg. were secured, one or two at a time. The usual form of *Epilobium latifolium* L. is quite common all around the bay, and on the south Twin island three specimens were collected with much larger flowers of a beautiful cream color, and with a delicate but perceptible odor. *Bartsia alpina* L., *Pedicularis Lapponica* L., *Erigeron uniflorus* L., *Arabis humifusa* var. *pubescens* Wat. and *Stellaria longipes* Goldie var. *Edwardsii* T. & G. were collected together on the first dry ground above high-water mark, while in the interior of the islands *Saxifraga Hirculus* L., *Saxifraga aizoides* L., *Pedicularis hirsuta* L. and *Luzula comosa* Meyer were frequently met with. On a grassy bank, by the only spring noticed on either island, grew *Veronica alpina* L., *Sibbaldia procumbens* L., *Ranunculus affinis* R. Br. var. *validus* Gray and *Parnassia Kotzebuei* Cham. & Sch., and these species were not seen in any other locality.

Although the exploration was carried on as far north as Cape Jones in lat. $54^{\circ} 30'$, no species were seen there that did not grow on the islands further south.

Of the three hundred or more species of flowering plants found growing around James bay I have mentioned only those that I considered the most interesting, but I do not doubt that future explorations will add many additional species to the list.

Ottawa, Canada.

Jacob Whitman Bailey.¹

STANLEY COULTER.

No sketch of North American botany would be complete were the name of Professor Bailey omitted. The record of his life and work is a record not only of interest, but of inspiration and encouragement to all botanists, in that it shows how great results may be attained, in spite of what to many might have seemed insuperable obstacles.

Jacob Whitman Bailey was born in the old town of Ward (now Auburn), Worcester county, Mass., on the 29th of April, 1811. In his boyhood he gave evidence of a taste for scientific studies, leaving the companionship and sports of those of his own age for solitary wanderings through the woods—not the mere purposeless excursions of boys, but for the collection of plants and minerals, which he afterward classified. This scientific taste seems to have come to him by direct inheritance from both branches of the ancestral line, his great-grandmother Whitman being especially distinguished for her love of botany and astronomy. Even as a boy was manifested that rare and beautiful modesty which characterized his after life. He worked and studied that he might satisfy himself, not that he might distinguish himself or surpass his schoolmates. Owing to the limited resources of the family, he was, at the age of twelve, placed in a circulating library and book store in Providence. In this position he found much time for self-improvement, devoting himself especially to the study of mineralogy and conchology. So earnestly studious was he that he attracted the attention of Mr. John Kingsberry, long secretary of Brown University, who, knowing the difficulties under which he was laboring, invited him to spend certain evenings of the week at his home for the purpose of studying Latin. The remaining

¹ The data for this sketch were furnished by Prof. W. W. Bailey, of Brown University from letters of his father in his possession and from his personal reminiscences.